State Highway Congestion Monitoring Program
(HICOMP)

Annual Report

Caltrans

November 2003

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Foreword

The purpose of the statewide Highway Congestion Monitoring Program (HICOMP) report is to measure congestion occurring on urban area freeways in California. The California Department of Transportation (Caltrans) has been publishing the HICOMP report since 1987.

Over the past five years, Caltrans has been examining ways to improve congestion monitoring. One effort in development, the Freeway Performance Measurement System (PeMS) is an Internet-based tool that can be used to monitor conditions on urban freeways. PeMS will allow users to produce congestion monitoring reports using automatically collected data from sensors statewide.

In conjunction with PeMS, Caltrans continues to address issues such as the current state of technology, methodological concerns, and stakeholders' interest in both recurrent and non-recurrent congestion. Caltrans recently completed a study to distinguish between recurrent congestion (i.e., regularly occurring peak period congestion) and non-recurrent congestion caused by incidents. This study will be the basis for the development of tools and techniques to measure the impact of accidents, weather, and special events on traffic congestion.

When the results of these efforts are adopted, future reports will follow a revised methodology. The new methodology will address shortcomings of current practices and support other Caltrans initiatives, such as system performance measurement and system management strategies. Until that time, reports will continue to use the traditional methodology.

More districts are adopting automatic data collection technologies. District 7 (Los Angeles/Ventura) has always used automatic data collection, while District 11 in San Diego has been increasing the use of loop detectors to collect congestion data. District 8 (San Bernardino/Riverside Counties) is using loop detector data on some of its freeway segments, and District 12 used loop detectors for the first time in 2002. This year's report also has updated urban area directional freeway mileage. Past HICOMP reports have used 1995 freeway miles for comparison purposes.

The 2002 HICOMP report presents congestion data on California urban freeway segments with a history of recurrent congestion. It does not include congestion on other State highways or local surface streets. Non-recurrent congestion such as weekend, holiday, or special event generated traffic congestion is also not included. **THIS REPORT REPRESENTS AVERAGE TRAFFIC CONDITIONS ON A TYPICAL WEEKDAY AND IS USEFUL FOR MAKING REGIONAL COMPARISONS OF FREEWAY PERFORMANCE ONLY.**

Estimates in this report are based on a limited number of observations. Actual conditions vary daily and seasonally. Due to differences in the way that congestion is defined and measured, the data presented in this report may not be comparable to the findings of other studies.

1. Introduction

Transportation facility construction and expansion has not kept pace with the growth of travel demand. This has resulted in an increase in urban freeway congestion over the past decade in most California metropolitan areas. From the public's perspective, the most noticeable effect of congestion on urban mobility is increased traffic delay. "Rush-hour" traffic in larger cities no longer occurs only during the traditional A.M. and P.M. peak periods, but also extends into much of a normal day.

Congestion can be described as either *recurrent* or *non-recurrent*. Recurrent congestion is the regular, everyday peak period delays that occur when the design capacity of a freeway is exceeded and low speeds result. Irregular events such as accidents, sporting events, maintenance, or short-term construction cause non-recurrent congestion. This report assumes that non-recurrent congestion is roughly equal to recurrent congestion. **THE PURPOSE OF THE CURRENT STATE HIGHWAY CONGESTION MONITORING PROGRAM (HICOMP) REPORT IS TO PRESENT RECURRENT CONGESTION DATA.** In some cases, the report discusses non-recurrent congestion, but in these cases, it is only to arrive at an approximation of the impacts of total congestion.

An objective of the California Department of Transportation (Caltrans) is to increase the efficiency of existing roads and other transportation facilities in order to reduce delays. The HICOMP report helps Caltrans to meet this objective by identifying the locations and extent of recurrent congestion on California's urban freeways. The HICOMP database provides the information needed to evaluate freeway performance so that Caltrans can establish priorities and direct resources to the areas with the most congestion. Data obtained from the congestion monitoring program also may be used to evaluate the effectiveness of technologies and strategies used to reduce congestion by comparing the changes in congestion before and after the implementation of new systems and programs.

1.1 Definition of Recurrent Congestion

This report defines recurrent congestion as a condition lasting for 15 minutes or longer where travel demand exceeds freeway design capacity and vehicular speeds are 35 miles per hour (mph) or less during peak commute periods on a typical incident-free weekday. This report uses three parameters to describe recurrent congestion:

1) Magnitude
2) Extent
3) Duration

Magnitude is the difference in time between the time it takes to travel a segment at the recorded congested speed and the travel time at 35 mph. "Vehicle-hours of delay per day" (vhdpd) is the term used to express the magnitude of the delay.

Extent is the length of a freeway segment by direction that experiences speeds below 35 mph for 15 minutes or more. Extent is expressed in terms of congested directional miles (cdm). It is important to note that a one-mile stretch of roadway contains two directional miles (one mile for each direction of travel). Directional miles differ from lane-miles, which is the number of lanes in a given direction multiplied by the length of the segment in that direction.

Duration is the length of time expressed in hours that the directional segment remains congested.

The HICOMP report discusses the magnitude and extent of congestion. Maps included in the report show the location and duration of congestion for all Caltrans districts experiencing congestion.

1.2 Data Collection Methodologies

Caltrans uses two principal methods to collect congestion data on urban freeways. The most common method is to drive specially equipped vehicles at regular intervals along freeways during the hours of recurrent peak period congestion. This is called the *floating vehicle* method, with the vehicles sometimes referred to as *probes* or *tachometer vehicles*. A tachometer system consists of a commercially available transmission sensor mounted in the engine compartment in line with the speedometer cable, a signal conditioner, and a laptop computer. The sensor counts the number of wheel rotations in one second and sends that data to a laptop computer. Software on the computer then translates this data into meaningful time, distance, and travel speed information.

The second method is to collect data from fixed sensors embedded in the pavement of the freeways. These sensors are permanent inductive loops (commonly referred to as *loop detectors*) placed at regular intervals along a freeway. Sometimes these loops control the timing of ramp meter traffic signals on California freeways. Exhibit 1-1 shows each district that reports congestion in the HICOMP report, the counties monitored in that district, and the type of technology used to collect congestion data. Appendix “A” at the end of this report contains a map showing all Caltrans districts and the counties that make up those districts.

Exhibit 1-1: Data Collection Methodology by District Reporting HICOMP Results

District (Office Location) Counties Monitored	Tachometer	Loop Detector
District 3 (Marysville) El Dorado, Placer, Sacramento	✓	
District 4 (Oakland) Alameda, Contra Costa, Marin, San Francisco San Mateo, Santa Clara, Solano, Sonoma	✓	
District 5 (San Luis Obispo) Monterey, San Luis Obispo Santa Cruz, Santa Barbara	✓	
District 6 (Fresno) Fresno, Kern	✓	
District 7 (Los Angeles) Los Angeles, Ventura	✓	✓
District 8 (San Bernardino) Riverside, San Bernardino	✓	✓
District 10 (Stockton) San Joaquin, Stanislaus	✓	
District 11 (San Diego) San Diego	✓	✓
District 12 (Irvine) Orange	✓	✓

In the tachometer method, a floating vehicle equipped with an electronic tachometer drives through congested areas along predetermined segments at 15 to 30-minute intervals. Each round trip is called a tachometer run. Typically, tachometer runs are made during peak hours, Tuesday through Thursday, in the spring and fall. Raw field data are collected at least two times for each segment and time period. For the 2002 HICOMP report, most runs took place in the fall of 2002, although some districts collected data in both the spring and fall of 2002.

The raw field data, combined with hourly traffic volumes, are converted into average daily vehicle-hours of delay and congested directional miles. The following formula produces the total delay associated with each segment:

Daily Vehicle-hours of delay = V × D × T

Where,
V - Volume in vehicles per hour = Number of lanes × Vehicles per hour per lane[1]
D - Duration of congestion in hours
T - Travel time (in hours) to cover a given distance under congested conditions minus the travel time at 35 mph.

[1] Vphpl is the design capacity of a road segment. Most districts use a value of 2,000 vphpl, although District 4 (Oakland) has been using a value of 2,200 vphpl since 1995.

If a driver observes an incident during a tachometer run or if traffic delay is caused by something other than “normal” recurrent congestion (e.g., inclement weather), the tachometer run is aborted.

Some Caltrans districts use electronic surveillance systems of loop detectors. The detectors are embedded in the pavement and are spaced approximately every half-mile. Communication lines transmit speed and volume data collected by the loop detectors to a mainframe computer in real-time.

District 7 (Los Angeles) uses loop detectors as its primary tool for measuring congestion, although for this year’s HICOMP the district used tachometer vehicles on some segments. In District 11 (San Diego), loop detector data have been used in conjunction with tachometer data since 1998, and each year more freeway segments are monitored using this technology. In 2001, District 8 began using loop detectors on some segments to produce the HICOMP report. District 12 began using loop detectors this year for one segment.

In District 7, printouts of vehicle speeds were made for specific freeway segments during peak commute periods. A preliminary analysis of the data was performed to select two representative fall days. A contour line drawn around each freeway segment where speeds fell below 35 mph identified locations where congestion occurred. The delay was then calculated for the area within the contour plot.

A similar approach was used in Districts 8, 11, and 12 but the data were analyzed using a Microsoft Access database program developed for this purpose. In these two districts, a statistical approach was used to estimate recurrent congestion days for each segment, and the delay was calculated using the same methodology as in District 7.

The tachometer and electronic surveillance methods each have advantages and disadvantages. The tachometer method records data for the entire length of the segment while the electronic method relies on fixed-point loop detectors that do not provide information about congested conditions between the loops. For the electronic method, assumptions are made about conditions between loops. However, an electronic surveillance system provides continuous coverage and captures almost all congestion occurrences. Tachometer runs generally are spaced 15 to 30 minutes apart, missing incremental congestion between runs. Furthermore, the cost of collecting tachometer severely limits the number of samples that can be collected. Unlike automatically collected data that collects data each day of the year and each hour of the day, tachometer data is only collected a few days per year at selected locations and time periods.

2. Statewide Summary

Since last year's HICOMP report, California urban freeway recurrent congestion declined by two percent from 522,416 vehicle-hours of delay per day (vhdpd) to 512,112 vhdpd. Congested miles of urban area freeways showed a slight increase of around three percent over the same period, growing from 1,925 last year to 1,941 in 2002.

Exhibits 2-1 through 2-4 summarize these congestion results for each district:

- Daily vehicle-hours of delay (Exhibit 2-1)
- Congested directional miles (Exhibit 2-2)
- Total directional miles (Exhibit 2-3)
- Congested directional miles to total directional miles (Exhibit 2-4)

As shown in Exhibit 2-1, delay statewide declined from 522,416 vhdpd last year to 512,112 this year. District 7 in Los Angeles contributed the most to this decrease in delay, declining from 183,209 vhdpd to 165,861 vhdpd (a 9 percent decline). District 4 lost nearly 7,600 vhdpd (five percent) and District 3 (Marysville) showed a decrease of around 1,300 vhdpd (an eight percent decline). [2]

These declines were countered by regions where delay grew in 2002. District 11 (San Diego) added almost 6,600 vhdpd (an 11 percent increase). District 12 (Orange County) and District 8 (Riverside/San Bernardino Counties) added an additional 8,700 vhdpd. District 10 (Stockton) led the state in percentage growth with a 24 percent increase, although in absolute numbers delay in District 10 grew by fewer than 800 vehicle-hours per day.

Two Caltrans districts make up two-thirds of all vehicle-hours of delay in California. District 7 accounts for around 32 percent of all delay, while District 4 contributes another 29 percent. Districts 11 and 12 together account for another 27 percent. The remaining districts contribute only 12 percent to statewide delay.

Exhibit 2-2 shows the congested directional miles for each district. Congested miles statewide grew by only one percent from last year to 1,941. District 12 contributed the most to this increase adding 72 congested directional miles (28 percent) while District 8 contributed 11 additional miles. District 7 reduced its congested miles by 44 miles with Districts 3 and 6 also showing declines.

District 7 reports 620 congested miles, which is just under a third of all congested miles in the state. Districts 4, 11, and 12 combine to contribute one-half of statewide miles. The remaining districts combined contribute less than 20 percent of total miles.

[2] Refer to Appendix “A” at the end of this report to see a map showing Caltrans District boundaries.

Exhibit 2-3 is a table new to this year's report showing total urban area freeway directional miles for each district. Between 1987 and 2002, statewide total miles grew by 725 miles (19 percent). This increase is due to a number of factors, principally: (1) In 1993, more existing freeway miles were determined to be "urban" based on the results of the 1990 census, (2) new freeway miles were built, and (3) existing urban road miles were upgraded to "freeway" status. Note that in 1995, Caltrans restructured district boundaries to match county lines. This change meant that some districts "lost" miles that were allocated to other districts. District 10 was most affected by this change.

Exhibit 2-4 illustrates the extent to which congestion is present on the state's freeway network. These results are calculated by taking the congested directional miles (Exhibit 2-2) and dividing them by the total directional miles (Exhibit 2-3).

Using this revised data, 43 percent of the State's total urban freeway miles in 2002 were congested, holding steady from 2001. Around 87 percent of District 12 urban freeway miles were congested in 2002, and nearly 60 percent of District 7 and District 11 urban freeway miles were congested.

Exhibit 2-5 and Exhibit 2-6 display the delay and congested mile trends for each district. Exhibit 2-5 shows that District 7 leads the state in vehicle-hours of delay, but delay in District 4 has grown rapidly since 1994. Both districts have experienced declines in delay since 2000.

Exhibit 2-6 shows District 7 accounting for the most congested directional miles with District 4 showing steady growth since 1994. However, congestion in Districts 11 and 12 also have been growing rapidly over time.

As illustrated in Exhibit 2-7, statewide vehicle-hours of delay generally have been growing at a faster rate than congested directional miles since congestion monitoring began in 1987. This trend was halted in 2002 since congested miles grew while delay declined slightly.

Exhibit 2-8 shows how counties compare in 2002 and 2001 in terms of vehicle-hours of daily delay. The top-ten most congested counties in the state remained largely unchanged since last year. Los Angeles, Orange, Alameda, San Diego, Santa Clara, and Riverside counties remained the most congested in 2002. San Francisco County moved back into the top-ten in 2002, replacing San Mateo County.

Exhibit 2-9 shows the approximate costs that recurrent and non-recurrent delay imposes on Californians (non-recurrent congestion is estimated to be equal to recurrent congestion). In 2002, delay is estimated to have cost California drivers around $11.9 million per day in lost time and excess fuel consumption. This delay is estimated to have added just over 512 tons of emissions to the air, compared to what would have been emitted at uncongested speeds. These estimates are based on the most recently available data.

Exhibit 2-10 shows changes in annual vehicle miles traveled (VMT) from 1987 to 2002 on highways operated by the state.

Exhibit 2-1: Daily Vehicle-Hours of Delay by District 1987-2002

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996+	1997+	1998++	1999	2000	2001	2002	Percent of Statewide 2002
District 3	1,280	1,402	1,820	1,832	1,984	1,956	2,264	2,676	3,172	3,356		7,809	8,907	10,896	16,200	14,872	3%
Annual % Change		10%	30%	1%	8%	-1%	16%	18%	19%	6%		53%	14%	22%	49%	-8%	
District 4 *	59,900	58,610	56,400	58,400	57,700	64,100	63,800	60,400	68,500	90,000		112,000	128,300	177,600	155,500	147,900	29%
Annual % Change		-2%	-4%	4%	-1%	11%	0%	-5%	13%	31%		12%	15%	38%	-12%	-5%	
District 5 *			610	680	1,400	1,480	1,530	880	n/ a			2,020	2,598	5,154	6,016	5,937	1%
Annual % Change				11%	106%	6%	3%	-42%				23%	29%	98%	17%	-1%	
District 6				118	257	280	276	222	223			75	257	334	522	508	0%
Annual % Change					118%	9%	-1%	-20%	0%			-31%	245%	30%	56%	-3%	
District 7 **	76,405	87,532	137,397	137,915	139,006	123,048	114,808	128,780	132,162			142,857	128,623	166,294	183,209	165,861	32%
Annual % Change		15%	57%	0%	1%	-11%	-7%	12%	3%			3%	-10%	29%	10%	-9%	
District 8 ***	6,730	5,855	10,797	11,634	14,445	15,651	14,910	13,023	13,231			29,368	33,384	38,244	33,079	36,935	7%
Annual % Change		-13%	84%	8%	24%	8%	-5%	-13%	2%			30%	14%	15%	-14%	12%	
District 10												2,711	3,292	3,930	3,340	4,127	1%
Annual % Change													21%	19%	-15%	24%	
District 11 ^	11,602	12,910	10,147	5,034	9,174	19,163	34,195	34,195	34,215			42,354	44,203	51,712	58,027	64,595	13%
Annual % Change		11%	-21%	-50%	82%	109%	78%	0%	0%			7%	4%	17%	12%	11%	
District 12 ^^	30,945	30,945	30,945	30,945	33,137	36,723	64,007	64,148	63,973			78,906	78,796	71,286	66,522	71,376	14%
Annual % Change		0%	0%	0%	7%	11%	74%	0%	0%			7%	0%	-10%	-7%	7%	
Totals	186,862	197,254	248,116	246,558	257,103	262,401	295,790	304,324	315,476			418,100	428,360	525,450	522,416	512,112	100%
Annual % Change++		6%	26%	-1%	4%	2%	13%	3%	4%			10%	2%	23%	-1%	-2%	

No Statewide Report Developed

*- District 5 data from Santa Cruz were extracted from District 4 report in years prior to 1995 when the Santa Cruz area was a part of District 4. No 1995 data are available for District 5.
**- 2002 District 7 figures reflect more comprehensive coverage. Years 1999, 2000, 2001 revised based on updated analysis.
***- District 8 began to use automatically collected data from freeway detectors on some District corridors in 2001.
^ - District 11 began to use automatically collected data from freeway detectors on some District corridors in 1998. Results for 1993 are estimated.
^^ - No data were collected for District 12 prior to 1991. Amount shown is estimated for 1987 - 1990.
+ - No statewide report developed in 1996 and 1997. Some Districts developed internal reports in 1996.
++ - Year 1998 percent change is the annualized percent change encompassing the missing years of data. It is not the total percent change between 1998 and the last year that congestion was monitored.

Exhibit 2-2: Urban Area Freeway Congested Directional Miles by District 1987-2002

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996+	1997+	1998++	1999	2000	2001	2002	Percent of Statewide 2001
District 3	28	23	24	50	39	41	53	54	55	60		98	83	95	121	112	6%
Annual % Change		-18%	4%	108%	-22%	5%	29%	2%	2%	9%		28%	-15%	14%	28%	-8%	
District 4 *	253	235	232	218	231	234	217	208	268	284		327	338	390	379	369	19%
Annual % Change		-7%	-1%	-6%	6%	1%	-7%	-4%	29%	6%		7%	3%	15%	-3%	-3%	
District 5 *			1	5	6	6	4	6	n/ a			19	16	41	38	42	2%
Annual % Change				400%	20%	0%	-33%	50%				33%	-17%	159%	-6%	9%	
District 6				6	10	13	12	11	13			2	13	9	20	16	1%
Annual % Change					67%	30%	-8%	-8%	18%			-49%	645%	-27%	113%	-17%	
District 7 **	464	514	542	536	564	521	505	556	556			566	566	617	664	620	32%
Annual % Change		11%	5%	-1%	5%	-8%	-3%	10%	0%			1%	0%	9%	8%	-7%	
District 8 ***	52	62	75	64	109	117	118	127	97			90	99	168	127	137	7%
Annual % Change		19%	21%	-15%	70%	7%	1%	8%	-24%			-3%	10%	71%	-25%	9%	
District 10												19	27	20	51	51	3%
Annual % Change													39%	-27%	159%	1%	
District 11 ^	59	55	33	21	32	104	66	66	69			125	172	289	273	269	14%
Annual % Change		-7%	-40%	-36%	52%	225%	-37%	0%	5%			22%	38%	69%	-6%	-1%	
District 12 ^^	127	127	127	127	127	189	150	138	133			204	295	269	254	326	17%
Annual % Change		0%	0%	0%	0%	49%	-21%	-8%	-4%			15%	45%	-9%	-6%	28%	
Totals	983	1,016	1,034	1,027	1,118	1,225	1,125	1,166	1,191			1,449	1,608	1,898	1,925	1,941	100%
Annual % Change++		3%	2%	-1%	9%	10%	-8%	4%	2%			7%	11%	18%	1%	1%	

No Statewide Report Developed

*- District 5 data from Santa Cruz were extracted from District 4 report in years prior to 1995 when the Santa Cruz area was a part of District 4. No 1995 data are available for District 5.
**- 2002 District 7 figures reflect more comprehensive coverage.
***- District 8 began to use automatically collected data from freeway detectors on some District corridors in 2001.
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++ - Year 1998 percent change is the annualized percent change encompassing the missing years of data. It is not the total percent change between 1998 and the last year that congestion was

Exhibit 2-3: Urban Area Freeway Total Directional Miles by District 1987-2002

	1987	1988	1989	1990	1991	1992	1993^	1994	1995^^	1996	1997	1998	1999	2000	2001	2002	Percent of Statewide 2001
District 3	288	288	288	291	291	291	319	319	319	319	319	319	319	317	317	320	7%
Annual % Change		0%	0%	1%	0%	0%	10%	0%	0%	0%	0%	0%	0%	-1%	0%	1%	
District 4 *	933	933	944	942	950	943	973	1,000	1,064	1,064	1,064	1,075	1,075	1,074	1,074	1,074	24%
Annual % Change		0%	1%	0%	1%	-1%	3%	3%	6%	0%	0%	1%	0%	0%	0%	0%	
District 5 *	170	170	170	170	170	170	185	185	226	226	226	226	226	226	226	226	5%
Annual % Change		0%	0%	0%	0%	0%	9%	0%	22%	0%	0%	0%	0%	0%	0%	0%	
District 6	182	182	188	187	187	187	208	208	239	239	239	241	255	260	268	268	6%
Annual % Change		0%	3%	0%	0%	0%	11%	0%	15%	0%	0%	1%	6%	2%	3%	0%	
District 7 **	1,000	1,000	998	998	997	996	1,059	1,059	1,059	1,059	1,059	1,061	1,061	1,065	1,065	1,075	24%
Annual % Change		0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%	1%	
District 8	361	361	383	376	381	381	480	486	523	526	526	542	542	542	555	572	13%
Annual % Change		0%	6%	-2%	1%	0%	26%	1%	8%	0%	0%	3%	0%	0%	2%	3%	
District 10	199	199	207	205	206	206	268	269	170	170	178	178	178	178	182	182	4%
Annual % Change		0%	4%	-1%	0%	0%	30%	0%	-37%	0%	5%	0%	0%	0%	2%	0%	
District 11	441	448	448	447	446	447	472	472	449	453	453	458	458	464	464	464	10%
Annual % Change		1%	0%	0%	0%	0%	6%	0%	-5%	1%	0%	1%	0%	1%	0%	0%	
District 12 **	258	258	260	262	264	264	277	277	291	315	340	357	376	376	376	376	8%
Annual % Change		0%	1%	1%	1%	0%	5%	0%	5%	8%	8%	5%	5%	0%	0%	0%	
Totals	3,832	3,838	3,885	3,878	3,893	3,884	4,242	4,275	4,340	4,370	4,403	4,457	4,489	4,503	4,527	4,557	100%
Annual % Change^++		0%	1%	0%	0%	0%	9%	1%	2%	1%	1%	1%	1%	0%	1%	1%	

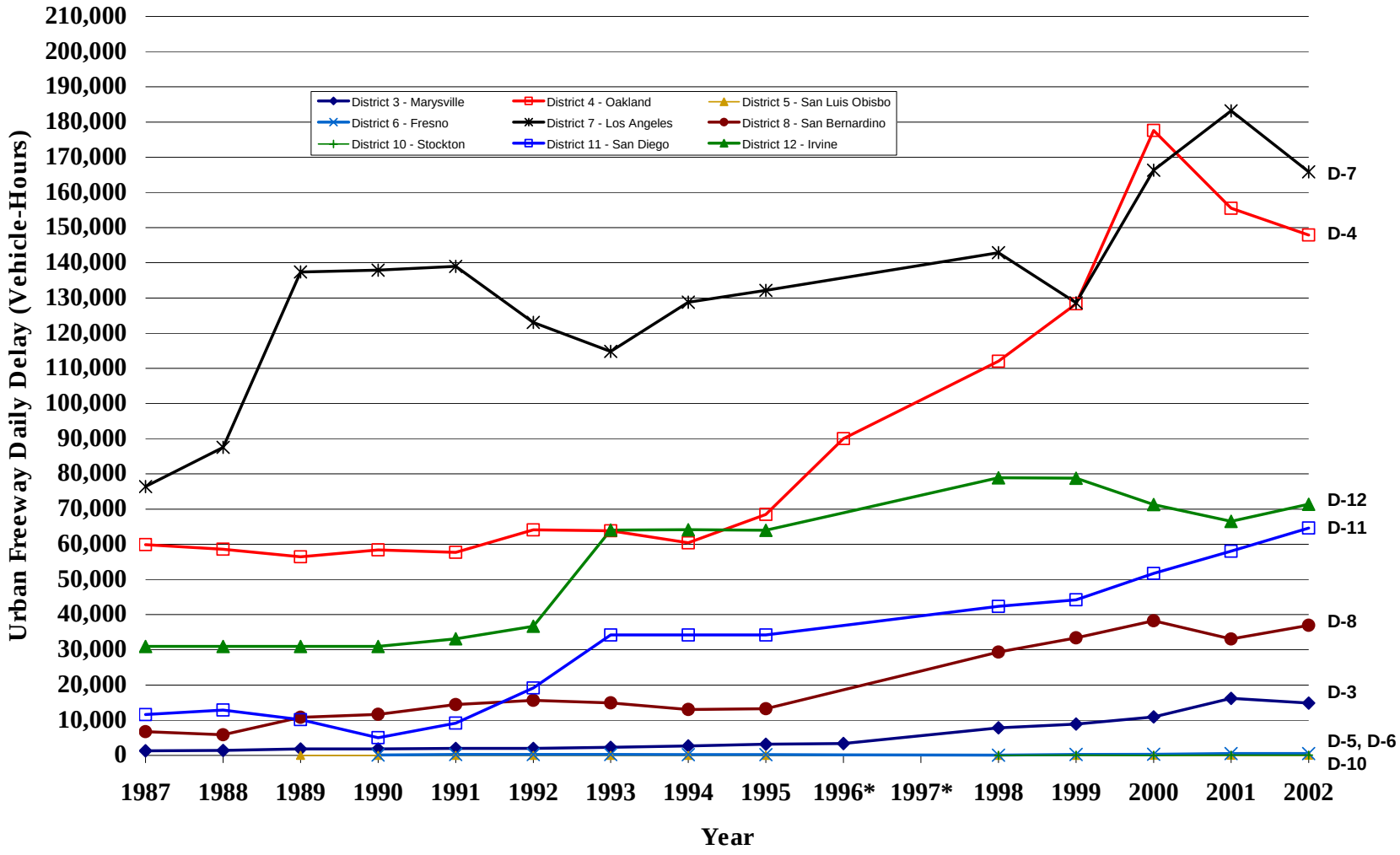
Note: Directional Urban Freeway Miles from the Caltrans Traffic Accident Surveillance and Analysis System (TASAS) highway inventory.
*- District 5 data from Santa Cruz were extracted from District 4 report in years prior to 1995 when the Santa Cruz area was a part of District 4.
**- 1987 District 7 and District 12 data estimated because District 12 was a part of District 7 until 1998.
^ - Urban/ rural boundaries were updated to reflect urbanized areas identified in the 1990 census. This accounts for the relatively large increase in miles in 1993.
^^ - In 1995, District boundaries were adjusted to follow county lines.

Exhibit 2-4: Congested Directional Miles to Total Directional Miles by District 1987-2002

	1987	1988	1989	1990	1991	1992	1993+	1994	1995+	1996++	1997++	1998	1999	2000	2001	2002
District 3	10%	8%	8%	17%	13%	14%	17%	17%	17%	19%		31%	26%	30%	38%	35%
District 4 *	27%	25%	25%	23%	24%	25%	22%	21%	25%	27%		30%	31%	36%	35%	34%
District 5 *			1%	3%	4%	4%	2%	3%	n/ a	No Statewide Report Developed		8%	7%	18%	17%	18%
District 6				3%	5%	7%	6%	5%	5%			1%	5%	4%	7%	6%
District 7 **	46%	51%	54%	54%	57%	52%	48%	53%	53%			53%	53%	58%	62%	58%
District 8 ***	14%	17%	20%	17%	29%	31%	25%	26%	19%			17%	18%	31%	23%	24%
District 10												11%	15%	11%	28%	28%
District 11 ^	13%	12%	7%	5%	7%	23%	14%	14%	15%			27%	38%	62%	59%	58%
District 12 ^^	49%	49%	49%	49%	48%	72%	54%	50%	46%			57%	79%	71%	68%	87%
Totals	26%	26%	27%	26%	29%	32%	27%	27%	27%			33%	36%	42%	43%	43%

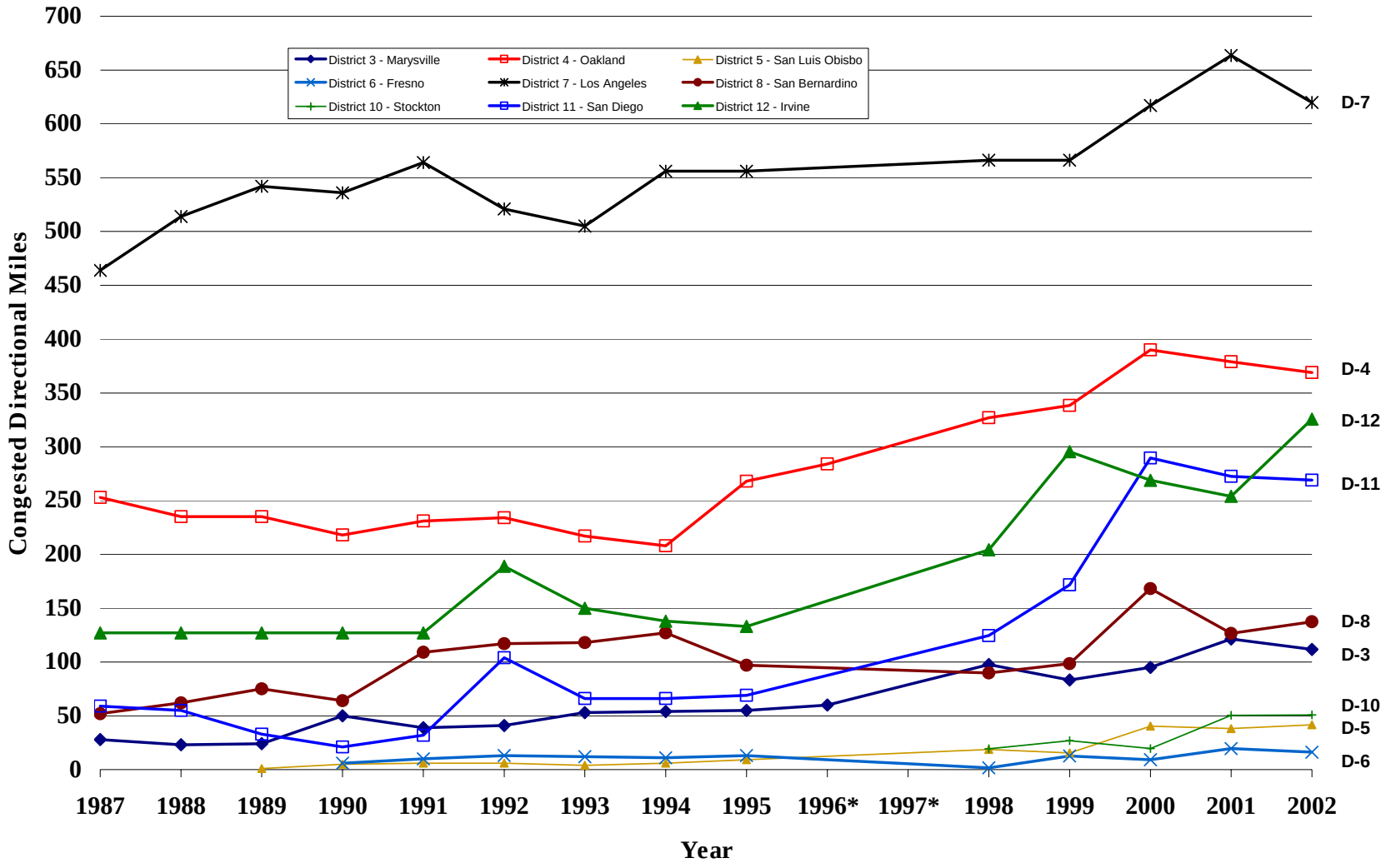
Note: Directional Urban Freeway Miles from the Caltrans Traffic Accident Surveillance and Analysis System (TASAS) highway inventory.
* - District 5 data from Santa Cruz were extracted from District 4 report in years prior to 1995 when the Santa Cruz area was a part of District 4. No 1995 data are available for
** - 2002 District 7 figures reflect more comprehensive coverage.
*** - District 8 began to use automatically collected data from freeway detectors on some District corridors in 2001.
^ - District 11 began to use automatically collected data from freeway detectors on some District corridors in 1998. Results for 1993 are estimated.
^^ - No data were collected for District 12 prior to 1991. Amount shown is estimated for 1987 - 1990.
+ - Dramatic changes in percentages may be due in part to changes in "urban" boundaries or in changes in District boundaries.
++ - No statewide report developed in 1996 and 1997. Some Districts developed internal reports in 1996.

Exhibit 2-5: Daily Vehicle Hours of Delay Trends by District 1987-2002



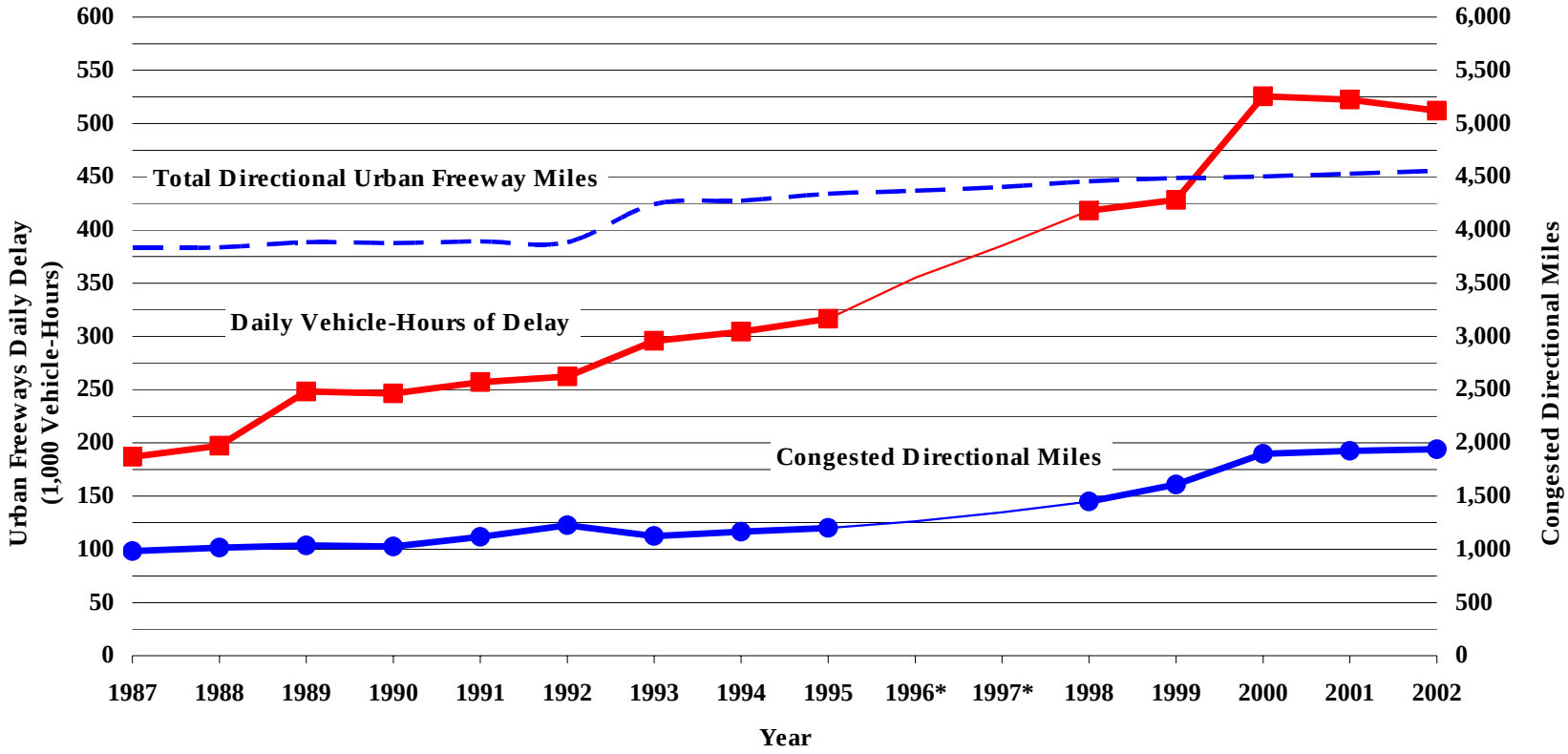
* - No statewide report was developed in 1996 and 1997. Internal district data were used where available for these years.
District 7 numbers for 2000 were revised based on an updated analysis.

Exhibit 2-6: Congested Directional Mile Trends by District 1987-2002



*- No statewide report was developed in 1996 and 1997. Internal district data were used where available for these years.
District 7 numbers for 2000 were revised based on an updated analysis.

Exhibit 2-7: Statewide Delay and Congested Directional Mile Trends 1987-2002



*- No statewide report was developed in 1996 and 1997. Internal district data were used where available for these years.
District 7 numbers for 2000 were revised based on an updated analysis.

Exhibit 2-8: Daily Delay and Congested Directional Miles County Rankings 2001-2002

Rank		Caltrans District	County	Daily Vehicle-Hours of Delay		Congested Directional Miles	
2002	2001			2002	2001	2002	2001
1	1	7	Los Angeles	165,474	200,666	612.0	646.0
2	2	12	Orange	71,376	66,522	325.6	253.9
3	4	11	San Diego	64,595	58,027	269.0	272.6
4	3	4	Alameda	61,300	65,600	101.0	95.0
5	5	4	Santa Clara	31,600	37,000	87.0	97.0
6	6	8	Riverside	26,549	23,073	74.8	59.6
7	7	4	Contra Costa	19,400	18,800	59.0	64.0
8	8	3	Sacramento	13,716	14,620	101.8	106.5
9	11	4	San Francisco	11,400	8,500	24.0	24.0
10	10	8	San Bernardino	10,386	10,006	62.6	67.0
11	12	4	Marin	8,400	7,900	21.0	19.0
12	9	4	San Mateo	7,700	10,900	33.0	38.0
13	14	4	Sonoma	4,400	4,400	25.0	27.0
14	15	10	San Joaquin	4,085	3,177	46.8	47.1
15	17	4	Solano	3,700	2,400	19.0	15.0
16	13	5	Santa Cruz	3,578	4,814	17.9	18.7
17	19	5	Santa Barbara	2,069	1,090	16.4	13.5
18	18	3	Placer	920	1,348	6.1	9.2
19	20	6	Fresno	508	441	16.2	17.8
20	16	7	Ventura	387	2,900	8.0	17.5
21	n/ a	5	Monterey	273	96	5.3	4.0
22	21	3	El Dorado	236	232	3.7	5.6
23	22	10	Stanislaus	41	164	4.0	3.4
24	25	5	San Luis Obispo	17	17	2.0	2.0
25	24	6	Kern	0	81	0.0	1.8
			Totals	**512,112**	**542,773**	**1,941**	**1,925**

Exhibit 2-9: 2002 Excess Fuel Consumption, Travel Cost, & Emissions Due to Congestion

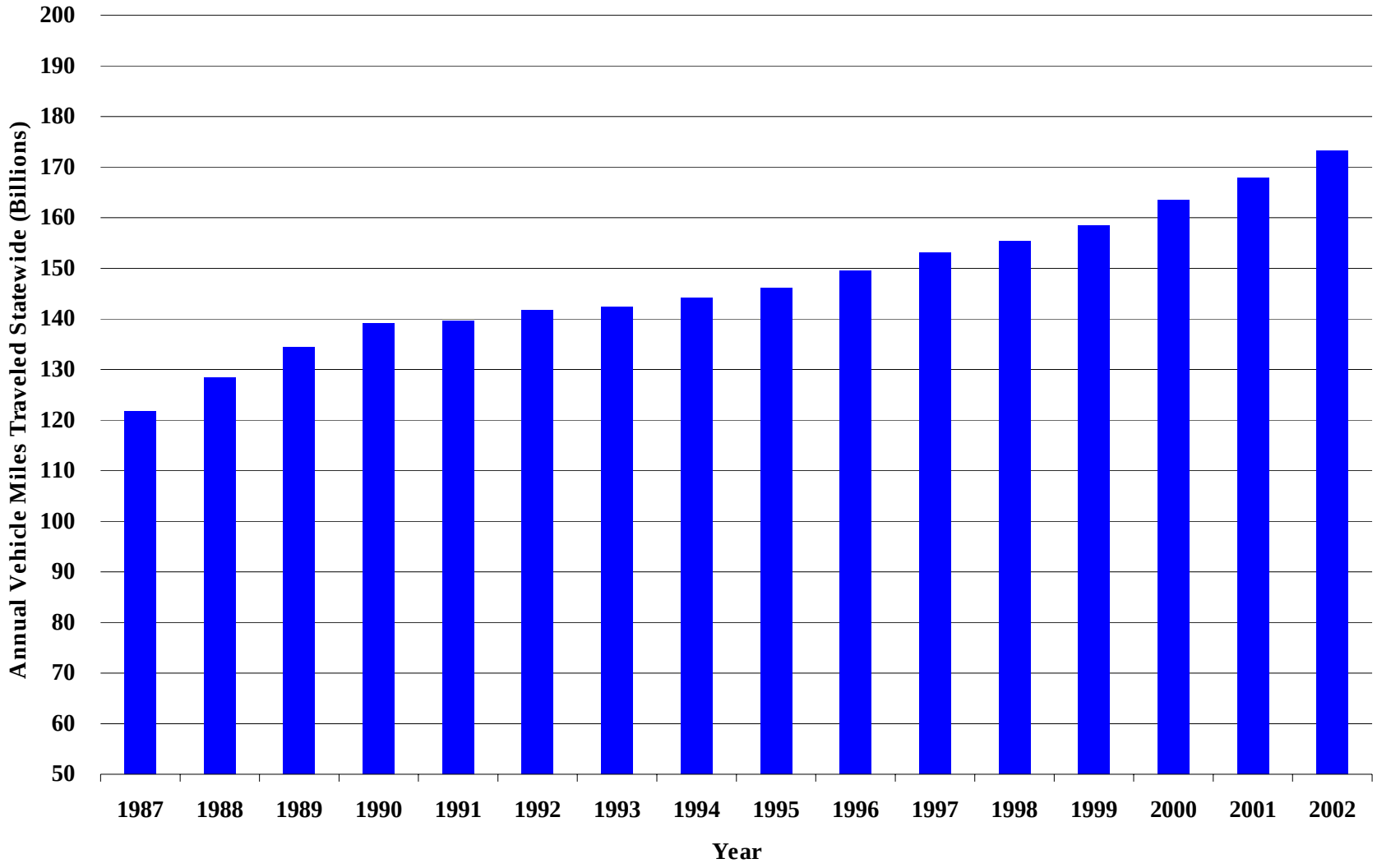
Indicator \ District	3	4	5	6	7	8	10	11	12	Total
Total Daily Delay (Vehicle-Hours) *	29,744	295,800	11,874	1,017	331,722	73,871	8,253	129,190	142,752	1,024,223
Excess Fuel Consumed per Day (Gallons) **	51,130	508,480	20,411	1,748	570,230	126,983	14,188	222,078	245,391	1,760,640
Total User Cost per Day (Dollars) ***	$346,787	$3,448,744	$138,439	$11,857	$3,867,561	$861,259	$96,227	$1,506,232	$1,664,356	$11,941,462
Total Emissions per Day (Tons) **	15	148	6	0.5	166	37	4	65	71	512

*- Recurrent congestion is a condition that occurs when operating speeds on the freeway remain below 35 MPH for 15 minutes or more on a typical incident-free weekday. Nonrecurrent congestion is congestion caused by incidents and special events, and is estimated to be equal to recurrent congestion. Therefore, total daily delay is double the non-recurrent congestion reported in the HICOMP report.

**- Fuel Efficient Traffic Signal Management Evaluation (Institute of Transportation Studies): 1,000 vehicle-hours of delay results in 1,719 gallons of wasted fuel and 1/ 2 ton of emissions.

***- Total user cost includes cost of travel time and cost of excess fuel. According to the memorandum to District Division Chiefs of October 24, 1996, the cost of travel time is $9.00 per vehicle-hour of delay. The cost of fuel is estimated at $1.55 per gallon, the average monthly price (weighted by monthly "vehicle miles traveled" estimates from Caltrans) for regular unleaded gasoline as reported by the California State Automobile Association (CSAA) monthly gas survey for the Year 2002.

Exhibit 2-10: California State Highway Vehicle Miles Traveled (VMT) 1987-2002



Source: Division of Traffic Operations, Traffic and Vehicle Data Systems Unit (http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/monthly/histdata.pdf)

3. District Level Findings and Analysis

This chapter presents the 2002 findings by Caltrans District. The results are presented in three formats: A district summary table presents total district-wide delay, congested directional miles, and county sub-totals. A chart shows the district trends over time for delay and congested miles. Finally, two maps are presented. These maps show the location and duration of freeway segments where congested was measured. The first map shows congested locations for the AM peak commute period, and the second maps shows the results for the PM peak commute period.

3.1 District 3: Sacramento Area

Exhibit 3-1 summarizes weekday recurrent congestion in District 3 during 2002 compared to 2001. Exhibit 3-2 presents trends in daily vehicle-hours of delay and congested directional miles for the district. Exhibits 3-4 and 3-5 are maps showing the location and duration of AM and PM period congestion.

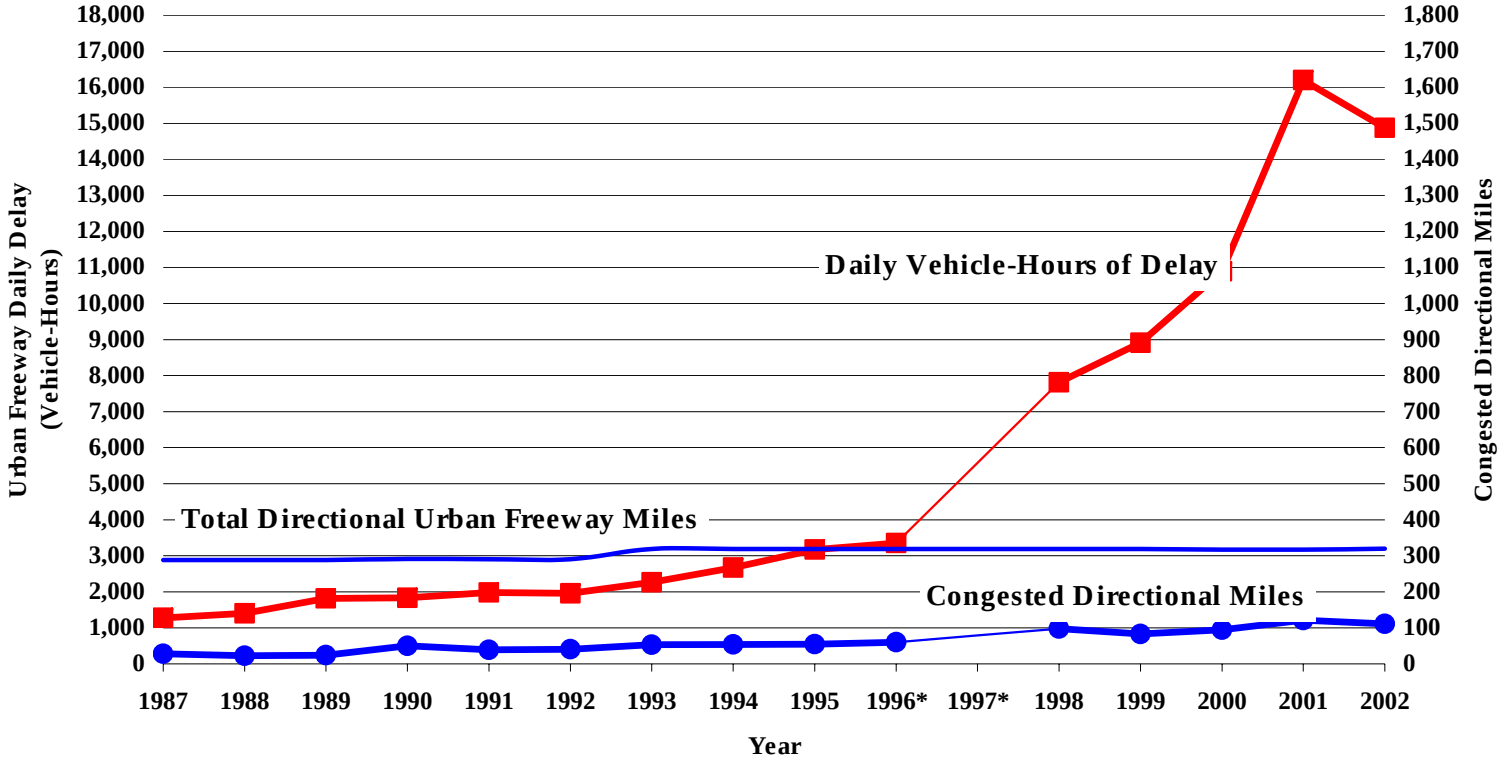
Both the 2001 and 2002 data used in this statewide congestion monitoring report are based on fall tachometer data collection efforts. Prior to 1998, delay estimates were based on both spring and fall tachometer data.

In 2002, the total vehicle-hours of delay per day (vhdpd) were 14,872, compared to 16,200 reported for 2001 (an eight percent decrease). Congested directional miles (cdm) were nearly 112 miles in 2002, an eight percent decline over the 121 miles reported in 2001.

Exhibit 3-1: District 3 Highway Congestion Summary

District 3	2001	2002	Percent Change 2001-2002	Percent of Statewide 2002
Daily Vehicle Hours of Delay	16,200	14,872	**-8%**	**3%**
El Dorado	232	236	2%	
Placer	1,348	920	-32%	
Sacramento	14,620	13,716	-6%	
Congested Directional Miles	121.3	111.6	**-8%**	**6%**
El Dorado	5.6	3.7	-34%	
Placer	9.2	6.1	-34%	
Sacramento	106.5	101.8		
Total Urban Area Freeway Directional Miles	317.2	319.8		
Congested Miles/ Total Urban Freeway Miles	38%	35%		

Exhibit 3-2: District 3 Congestion Trends 1987-2002



* - No statewide report developed in 1996 or 1997. District 3 developed an internal report in 1996.

Exhibit 3-3: Sacramento Area A.M. Congestion Map

DISTRICT 3 AM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

Exhibit 3-4: Sacramento Area P.M. Congestion Map

DISTRICT 3 PM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

3.2 District 4: San Francisco Bay Area

Exhibit 3-5 summarizes weekday recurrent congestion in District 4 during 2002 compared to 2001. Exhibit 3-6 presents trends in daily vehicle-hours of delay and congested directional miles for the district. Exhibits 3-7 and 3-8 are maps showing the location and duration of AM and PM period congestion.

District 4 collects data in both the spring and fall seasons for the statewide HICOMP report.

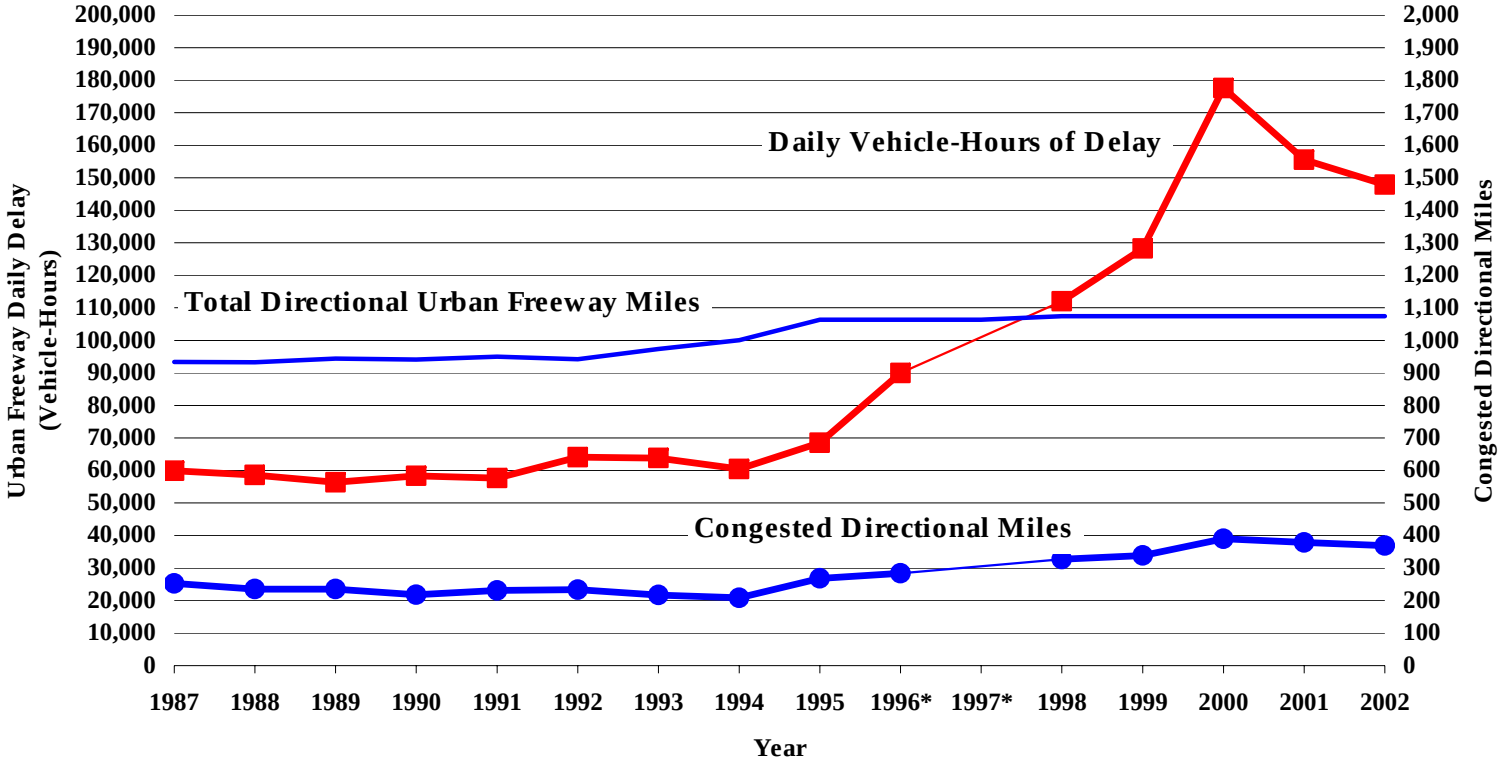
In 2002, the total vehicle-hours of delay per day (vhdpd) were 147,900 compared to 155,500 reported for 2001 (a five percent decrease). Congested directional miles (cdm) were 369 miles in 2002, down three percent from 2001.

Exhibit 3-5: District 4 Highway Congestion Summary

District 4	2001	2002	Percent Change 2001-2002	Percent of Statewide 2002
Daily Vehicle Hours of Delay	155,500	147,900	**-5%**	**29%**
Alameda	65,600	61,300	-7%	
Contra Costa	18,800	19,400	3%	
Marin	7,900	8,400	6%	
Napa	-	-	n/ a	
San Francisco	8,500	11,400	34%	
San Mateo	10,900	7,700	-29%	
Santa Clara	37,000	31,600	-15%	
Solano	2,400	3,700	54%	
Sonoma	4,400	4,400	0%	
Congested Directional Miles	379.0	369.0	**-3%**	**19%**
Alameda	95.0	101.0	6%	
Contra Costa	64.0	59.0	-8%	
Marin	19.0	21.0	11%	
Napa	-	-	n/ a	
San Francisco	24.0	24.0	0%	
San Mateo	38.0	33.0	-13%	
Santa Clara	97.0	87.0	-10%	
Solano	15.0	19.0	27%	
Sonoma	27.0	25.0	-7%	
Total Urban Area Freeway Directional Miles	1,074.4	1,074.4		
Congested Miles/ Total Urban Freeway Miles	35%	34%		

Note: County numbers may not sum to District totals due to rounding.

Exhibit 3-6: District 4 Congestion Trends 1987-2002



* - No statewide report in 1996 or 1997. District 4 developed an internal report in 1996.

Exhibit 3-7: San Francisco Bay Area A.M. Congestion Map

DISTRICT 4 AM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_D04_11x17.DOC”

Exhibit 3-8: San Francisco Bay Area P.M. Congestion Map

DISTRICT 4 PM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_D04_11x17.DOC”

3.3 District 5: Central Coast Area

Exhibit 3-9 summarizes weekday recurrent congestion in District 5 during 2002 compared to 2001. Exhibit 3-10 presents trends in daily vehicle-hours of delay and congested directional miles for the district. Exhibits 3-11 and 3-12 are maps showing the location and duration of AM and PM period congestion.

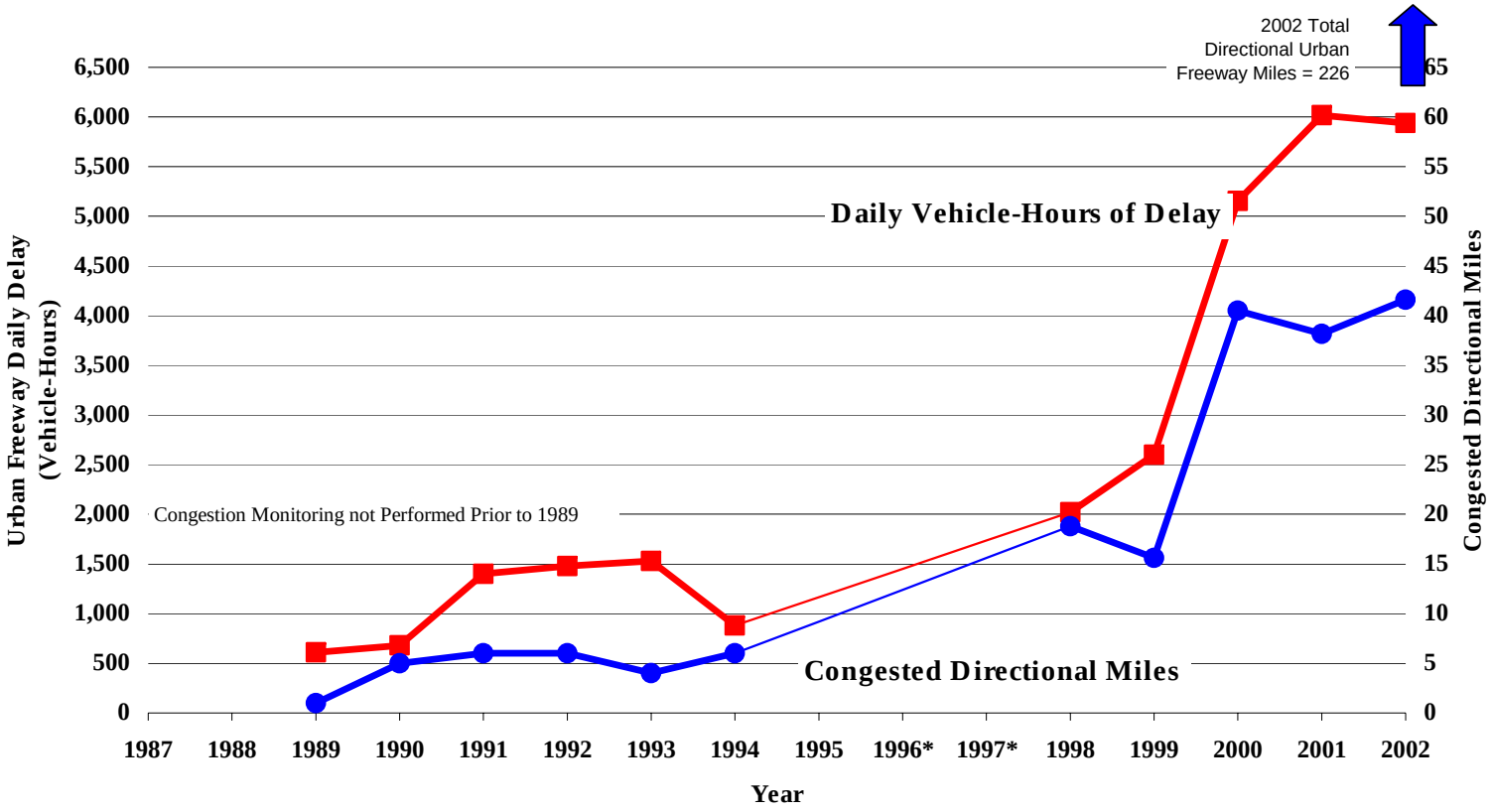
Both the 2001 and 2002 data used in this statewide congestion monitoring report are based on fall data collection. Prior to 1998, delay estimates were based on both spring and fall tachometer data.

In 2002, the total vehicle-hours of delay per day (vhdpd) were 5,937, compared to just over 6,000 reported for 2001, a slight decline. Congested directional miles (cdm) were nearly 42 miles in 2002, a nine percent increase from the 38 miles reported in 2001.

Exhibit 3-9: District 5 Highway Congestion Summary

District 5	2001	2002	Percent Change 2001-2002	Percent of Statewide 2002
Daily Vehicle Hours of Delay	6,016	5,937	**-1%**	**1%**
Monterey	96	273	184%	
San Luis Obispo	17	17	0%	
Santa Barbara	1,090	2,069	90%	
Santa Cruz	4,814	3,578	-26%	
Congested Directional Miles	38.2	41.6	**9%**	**2%**
Monterey	4.0	5.3	n/ a	
San Luis Obispo	2.0	2.0	0%	
Santa Barbara	13.5	16.4	21%	
Santa Cruz	18.7	17.9	-4%	
Total Urban Area Freeway Directional Miles	226.0	226.0		
Congested Miles/ Total Urban Freeway Miles	17%	18%		

Exhibit 3-10: District 5 Congestion Trends 1989-2002



* - No statewide report developed in 1996 or 1997.

Exhibit 3-11: Central Coast Area A.M. Congestion Map

DISTRICT 5 AM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

Exhibit 3-12: Central Coast Area P.M. Congestion Map

DISTRICT 5 PM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

3.4 District 6: Fresno Area

Exhibit 3-13 summarizes weekday recurrent congestion in District 6 during 2002 compared to 2001. Exhibit 3-14 presents trends in daily vehicle-hours of delay and congested directional miles for the district. Exhibits 3-15 and 3-16 are maps showing the location and duration of AM and PM period congestion.

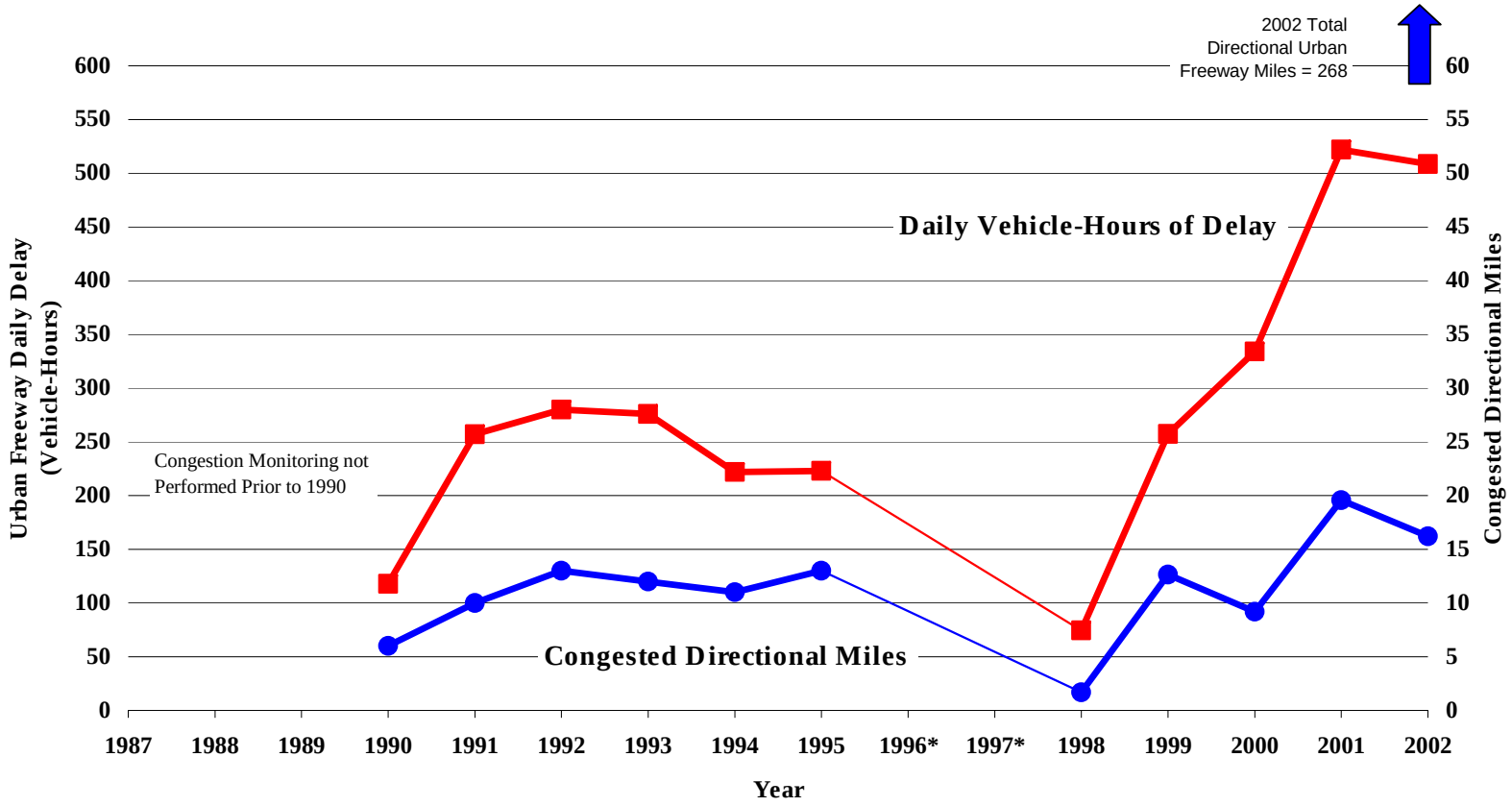
The 2002 District 6 results in this report are based on tachometer data collected in both the fall and spring seasons. The 2001 results are based on fall data collection only. Prior to 1998, delay estimates were based on both spring and fall tachometer data.

In 2002, the total vehicle-hours of delay per day (vhdpd) were 508 compared to the 522 hours reported for 2001 (a three percent decrease). Congested directional miles (cdm) were just over 16 miles in 2002, a 3-mile decline from the 19 miles reported in 2001. Since the year 2001 District 6 vhdpd and cdm numbers were relatively small to begin with, any small change for 2002 may translate to large percentage increases.

Exhibit 3-13: District 6 Highway Congestion Summary

District 6	2001	2002	Percent Change 2001-2002	Percent of Statewide 2002
Daily Vehicle Hours of Delay	522	508	**-3%**	**0%**
Fresno	441	508	15%	
Kern	81	-	-100%	
Congested Directional Miles	19.6	16.2	**-17%**	**1%**
Fresno	17.8	16.2	-9%	
Kern	1.8	-	-100%	
Total Urban Area Freeway Directional Miles	268.0	268.0		
Congested Miles/ Total Urban Freeway Miles	7%	6%		

Exhibit 3-14: District 6 Congestion Trends 1990-2002



* - No statewide report developed in 1996 or 1997.

Exhibit 3-15: Fresno Area A.M. Congestion Map

DISTRICT 6 AM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

Exhibit 3-16: Fresno Area P.M. Congestion Map

DISTRICT 6 PM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

3.5 District 7: Los Angeles-Ventura Area

Exhibit 3-17 summarizes weekday recurrent congestion in District 7 during 2002 compared to 2001. Exhibit 3-18 presents trends in daily vehicle-hours of delay and congested directional miles for the district. Exhibits 3-19 and 3-20 are maps showing the location and duration of AM and PM period congestion.

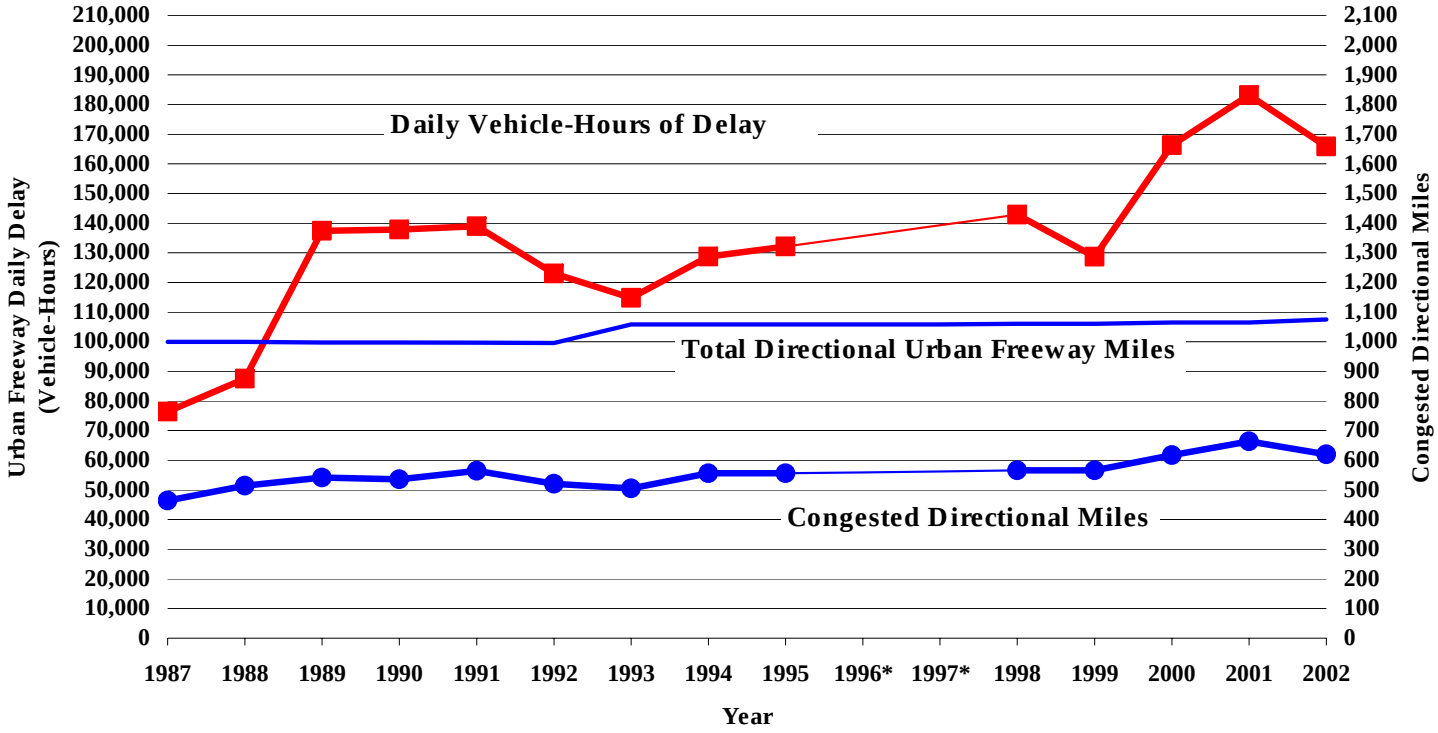
Both the 2001 and 2002 data used in this statewide congestion monitoring report are based on fall data collection efforts only. Prior to 1998, delay estimates were based on both spring and fall loop detector data.

In 2002, the total vehicle-hours of delay per day (vhdpd) were 165,861 compared to 183,209 hours reported for 2001 (a nine percent decline). Congested directional miles (cdm) were 620 miles in 2002, a decrease of seven percent from the 664 miles reported in 2001.

Exhibit 3-17: District 7 Highway Congestion Summary

District 7	2001	2002	Percent Change 2001-2002	Percent of Statewide 2002
Daily Vehicle Hours of Delay	183,209	165,861	**-9%**	**32%**
Los Angeles	180,599	165,474	-8%	
Ventura	2,610	387	-85%	
Congested Directional Miles	663.5	620.0	**-7%**	**32%**
Los Angeles	646.0	612.0	-5%	
Ventura	17.5	8.0	-54%	
Total Urban Area Freeway Directional Miles	1,064.8	1,074.8		
Congested Miles/ Total Urban Freeway Miles	62%	58%		

Exhibit 3-18: District 7 Congestion Trends 1987-2002



* - No statewide report developed in 1996 or 1997.

Exhibit 3-19: Los Angeles-Ventura Area A.M. Congestion Map

DISTRICT 7 AM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_D07_11x17.DOC”

Exhibit 3-20: Los Angeles-Ventura Area P.M. Congestion Map

DISTRICT 7 PM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_D07_11x17.DOC”

3.6 District 8: San Bernardino-Riverside Area

Exhibit 3-21 summarizes weekday recurrent congestion in District 8 during 2002 compared to 2001. Exhibit 3-22 presents trends in daily vehicle-hours of delay and congested directional miles for the district. Exhibits 3-23 and 3-24 are maps showing the location and duration of AM and PM period congestion.

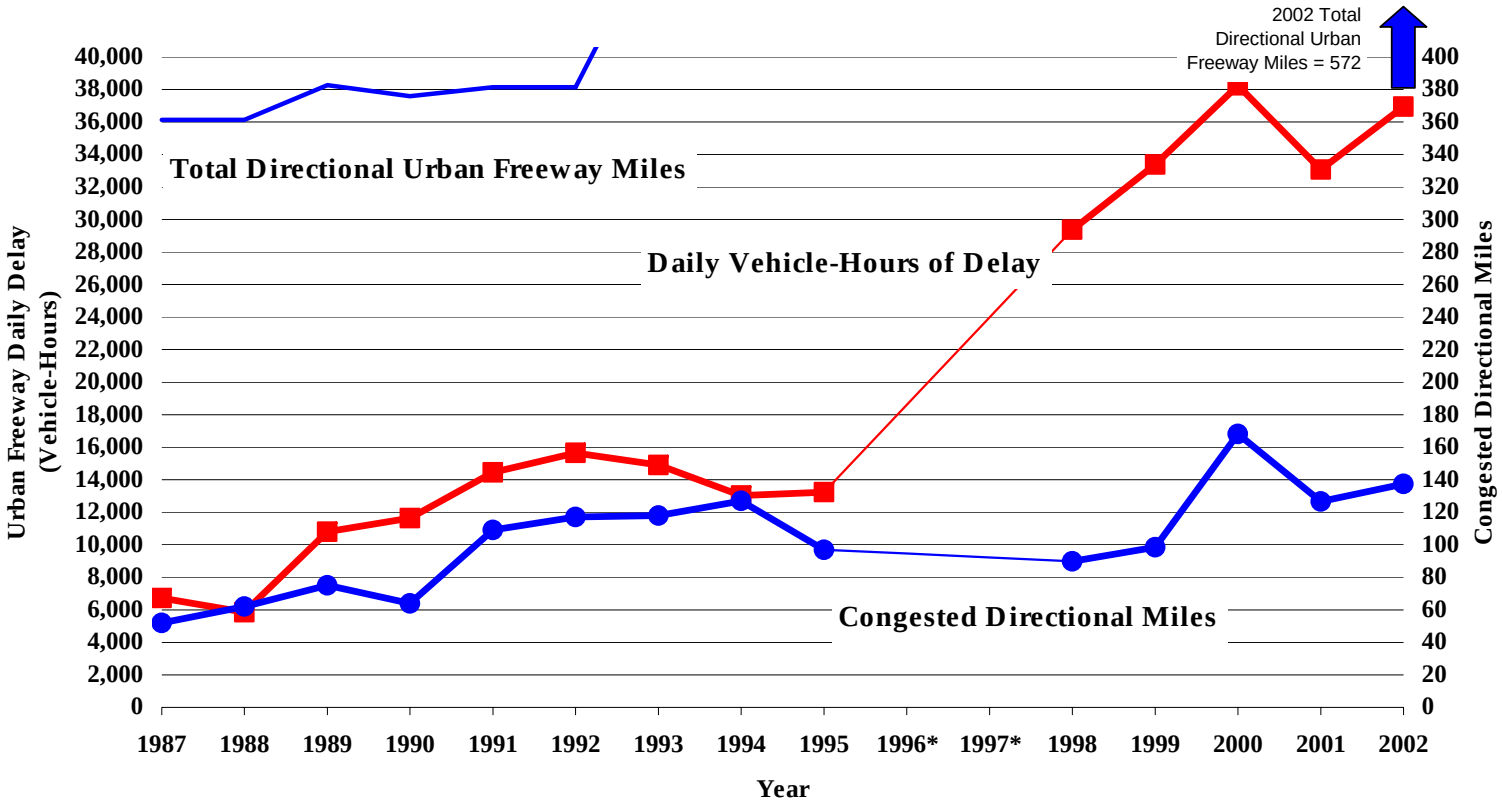
Both the 2001 and 2002 data used in this statewide congestion monitoring report are based on fall data collection efforts only. Prior to 1998, delay estimates were based on both spring and fall tachometer data. For the first time in 2002, District 8 relied on loop detector data to estimate delay for some route segments. Other segments were monitored using tachometer equipped vehicles. The transition from tachometer data to loop detector data may result in differences in congestion totals between 2001 and 2002 because of differences in estimation methodologies.

In 2002, the total vehicle-hours of delay per day (vhdpd) were just over 36,900 compared to around 33,100 hours reported for 2001 (an increase of 12 percent). Congested directional miles (cdm) were 137 miles in 2002, an increase of nine percent over the 127 miles reported in 2001.

Exhibit 3-21: District 8 Highway Congestion Summary

District 8	2001	2002	Percent Change 2001-2002	Percent of Statewide 2002
Daily Vehicle Hours of Delay	33,079	36,935	**12%**	**7%**
Riverside	23,190	26,549	14%	
San Bernardino	9,888	10,386	5%	
Congested Directional Miles	126.6	137.4	**9%**	**7%**
Riverside	60.6	74.8	23%	
San Bernardino	66.0	62.6	-5%	
Total Urban Area Freeway Directional Miles	555.0	571.6		
Congested Miles/ Total Urban Freeway Miles	23%	24%		

Exhibit 3-22: District 8 Congestion Trends 1987-2002



* - No statewide report developed in 1996 or 1997.

Exhibit 3-23: San Bernardino-Riverside Area A.M. Congestion Map

DISTRICT 8 AM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

Exhibit 3-24: San Bernardino-Riverside Area P.M. Congestion Map

DISTRICT 8 PM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

3.7 District 10: Stockton Area

Exhibit 3-25 summarizes weekday recurrent congestion in District 10 during 2002 compared to 2001. Exhibit 3-26 presents trends in daily vehicle-hours of delay and congested directional miles for the district. Exhibits 3-27 and 3-28 are maps showing the location and duration of AM and PM period congestion.

Both the 2001 and 2002 data used in this statewide congestion monitoring report are based on fall data collection efforts only. District 10 has been monitoring traffic congestion for the HICOMP report since 1998.

In 2002, the total vehicle-hours of delay per day (vhdpd) were 4,127 compared to 3,340 hours reported for 2001 (a 24 percent increase). Congested directional miles (cdm) were nearly 51 miles in 2002, the same as in 2001.

Exhibit 3-25: District 10 Highway Congestion Summary

District 10	2001	2002	Percent Change 2001-2002	Percent of Statewide 2002
Daily Vehicle Hours of Delay	3,340	4,127	**24%**	**1%**
San Joaquin	3,177	4,085	29%	
Stanislaus	164	41	-75%	
Congested Directional Miles	50.5	50.8	**1%**	**3%**
San Joaquin	47.1	46.8	-1%	
Stanislaus	3.4	4.0	20%	
Total Urban Area Freeway Directional Miles	182.0	182.0		
Congested Miles/ Total Urban Freeway Miles	28%	28%		

Exhibit 3-26: District 10 Congestion Trends 1998-2002

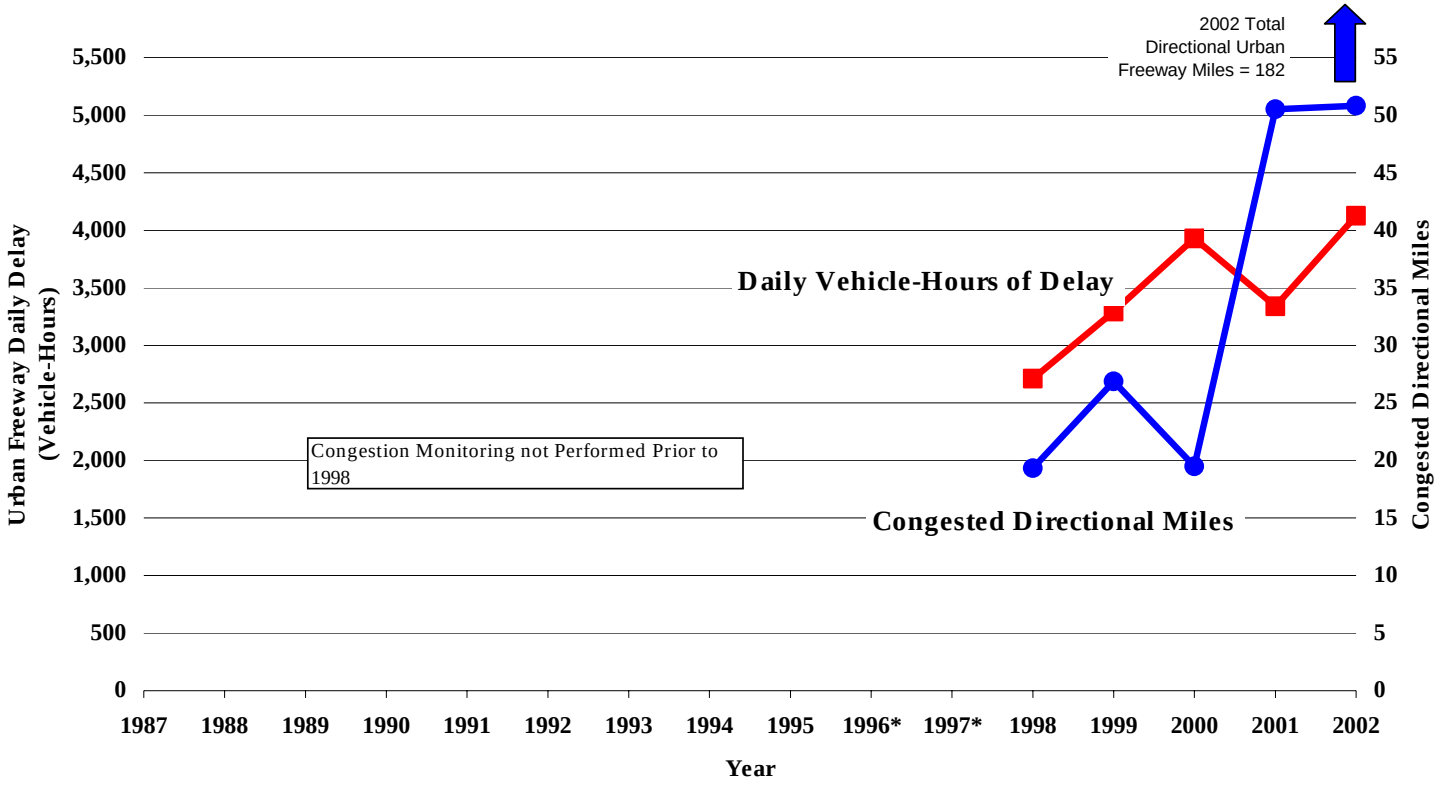


Exhibit 3-27: Stockton Area A.M. Congestion Map

DISTRICT 10 AM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

Exhibit 3-28: Stockton Area P.M. Congestion Map

DISTRICT 10 PM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

3.8 District 11: San Diego Area

Exhibit 3-29 summarizes weekday recurrent congestion in District 11 during 2002 compared to 2001. Exhibit 3-30 presents trends in daily vehicle-hours of delay and congested directional miles for the district. Exhibits 3-31 and 3-32 are maps showing the location and duration of AM and PM period congestion.

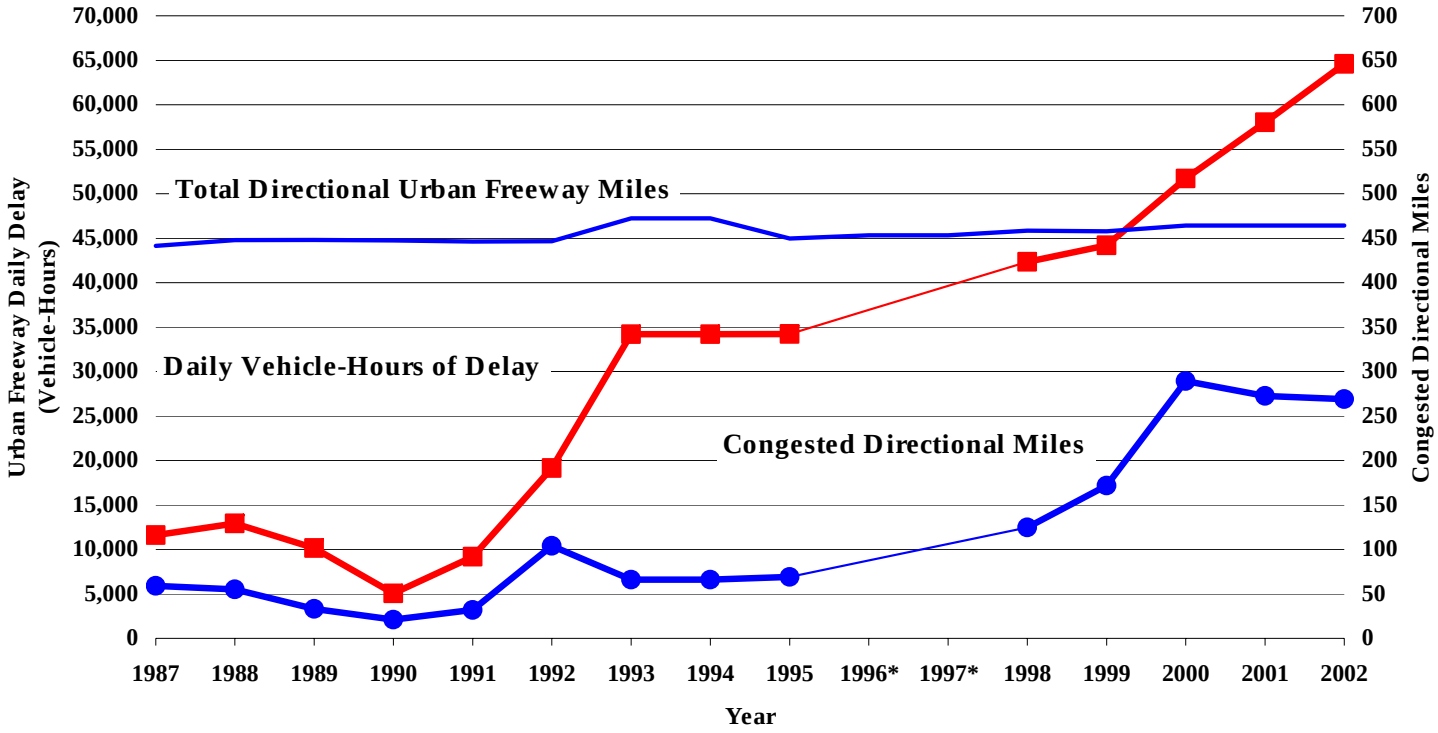
Both the 2001 and 2002 data used in this statewide congestion monitoring report are based on fall data collection efforts only. Prior to 1998, delay estimates were based on both spring and fall tachometer data. Since 1998, District 11 has been using fall loop detector data to estimate delay for some route segments. Other segments were monitored using tachometer equipped vehicles.

In 2002, the total vehicle-hours of delay per day (vhdpd) were just under 65,000 compared to around 58,000 hours reported for 2001 (an increase of 11 percent). Congested directional miles (cdm) were 269 miles in 2002, a slight decrease of one percent from the nearly 273 miles reported in 2001.

Exhibit 3-29: District 11 Highway Congestion Summary

District 11	2001	2002	Percent Change 2001-2002	Percent of Statewide 2002
Daily Vehicle Hours of Delay	58,027	64,595	**11%**	**13%**
San Diego	58,027	64,595	11%	
Congested Directional Miles	272.6	269.0	**-1%**	**14%**
San Diego	272.6	269.0	-1%	
Total Urban Area Freeway Directional Miles	464.0	464.0		
Congested Miles/ Total Urban Freeway Miles	59%	58%		

Exhibit 3-30: District 11 Congestion Trends 1987-2002



* - No statewide report developed in 1996 or 1997.

Exhibit 3-31: San Diego Area A.M. Congestion Map

DISTRICT 11 AM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

Exhibit 3-32: San Diego Area P.M. Congestion Map

DISTRICT 11 PM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

3.9 District 12: Orange County

Exhibit 3-33 summarizes weekday recurrent congestion in District 12 during 2002 compared to 2001. Exhibit 3-34 presents trends in daily vehicle-hours of delay and congested directional miles for the district. Exhibits 3-35 and 3-36 are maps showing the location and duration of AM and PM period congestion.

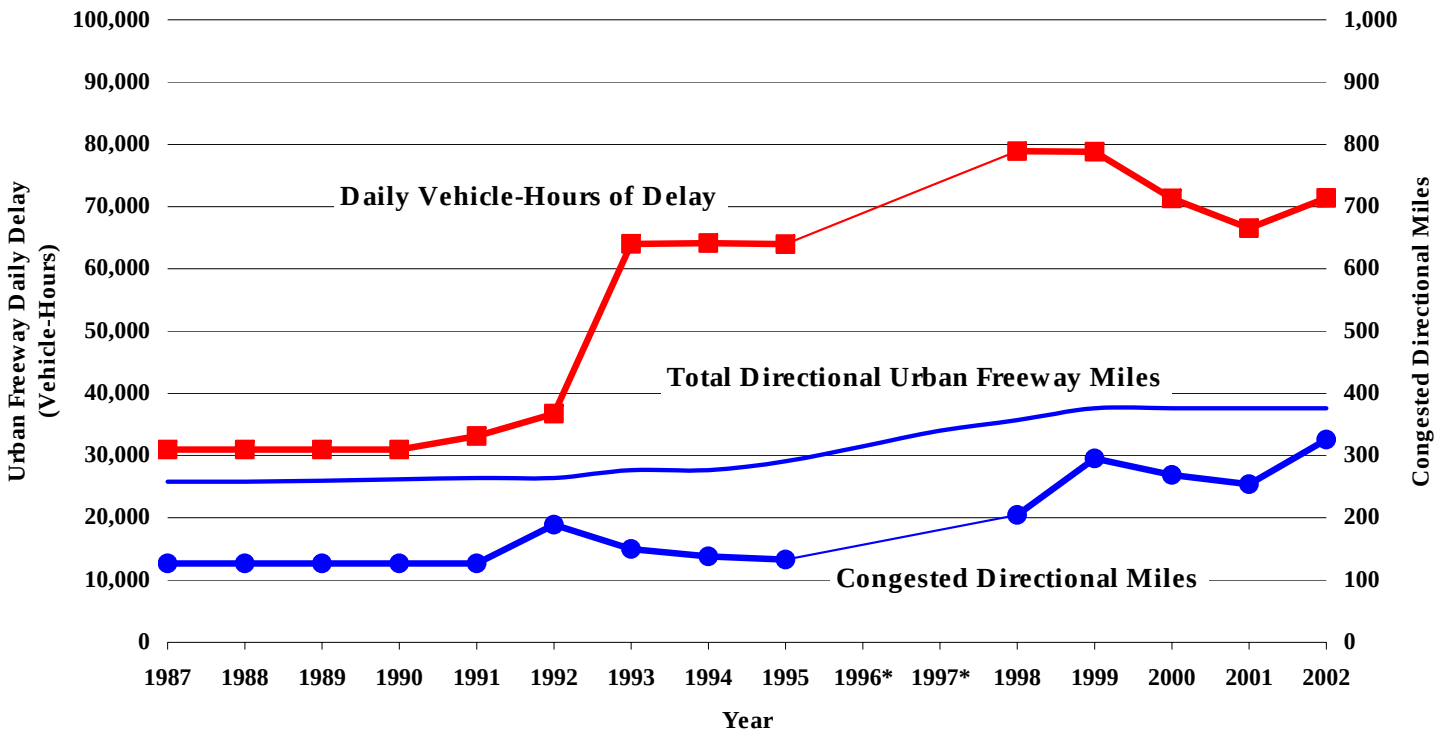
Both the 2001 and 2002 data used in this statewide congestion monitoring report are based on fall data collection efforts only. Prior to 1998, delay estimates were based on both spring and fall loop detector data.

In 2002, the total vehicle-hours of delay per day (vhdpd) were 71,376 compared to just over 66,500 hours reported for 2001 (a seven percent increase). Congested directional miles (cdm) were 326 miles in 2002, a 28 percent increase from the nearly 254 miles reported in 2001.

Exhibit 3-33: District 12 Highway Congestion Summary

District 12	2001	2002	Percent Change 2001-2002	Percent of Statewide 2002
Daily Vehicle Hours of Delay	66,522	71,376	**7%**	**14%**
Orange	66,522	71,376	7%	
Congested Directional Miles	253.9	325.6	**28%**	**17%**
Orange	253.9	325.6	28%	
Total Urban Area Freeway Directional Miles	376.0	376.0		
Congested Miles/ Total Urban Freeway Miles	68%	87%		

Exhibit 3-34: District 12 Congestion Trends 1987-2002



* - No statewide report developed in 1996 or 1997.

Exhibit 3-35: Orange County A.M. Congestion Map

DISTRICT 12 AM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

Exhibit 3-36: Orange County P.M. Congestion Map

DISTRICT 12 PM MAP CAN BE FOUND IN MICROSOFT WORD DOCUMENT “2002_HICOMP_MAPS_8.5x11.DOC”

Appendix A: Caltrans District and County Map

Numbers highlighted in **BLUE** are district numbers.

Appendix B: Caltrans Contacts

District	Contact Person	Public Number	Email Address
03	Matt Taghipour	(916) 859-7950	Matt_Taghipour@dot.ca.gov
04	Ron Kyutoku	(510) 286-4640	Ron_Kyutoku@dot.ca.gov
05	Roger Barnes	(805) 594-6190	Roger_D_Barnes@dot.ca.gov
06	Albert Lee	(209) 488-4111	Albert_Lee@dot.ca.gov
07	Kirk Patel	(213) 897-1825	Kirk_Patel@dot.ca.gov
08	Hamid Samani	(909) 383-4476	Hamid_Samani@dot.ca.gov
10	Arlene Cordero	(209) 948-3894	Arlene_Benedicto@dot.ca.gov
11	Mike Powers	(619) 718-7848	Michael_Powers@dot.ca.gov
12	Farid Nowshiravan	(949) 756-7639	Farid_Nowshiravan@dot.ca.gov
HQ	Rex Cluff	(916) 651-9059	Rex_Cluff@dot.ca.gov

Appendix C: Glossary of Terms

Directional Mile – A one-mile length of freeway has two directional miles, irrespective of number of lanes.

Duration – The length of time the freeway directional segment remains congested expressed in hours.

Extent – The length of freeway segment, by direction, experiencing speeds below 35 mph for 15 minutes or more. Extent is expressed in terms of congested directional miles (cdm).

Freeway Service Patrol (FSP) – Free tow service that assists disabled motorists in congested urban areas.

High Occupancy Vehicle Lanes (HOV) – Lanes on freeways restricted to vehicles carrying more than one person or to public transportation vehicles. Minimum vehicle occupancies can be either two or three people depending on the highway segment. HOV lanes are designed to encourage ridesharing.

Magnitude – The difference in travel time between 35 mph and the lower congested speed and is expressed in terms of vehicle-hours of delay per day (vhdpd).

Metered Connector – Ramp meter on a freeway-to-freeway connector.

Non-Recurrent Congestion – Caused by events that occur irregularly such as accidents, sporting events, and maintenance or construction.

Ramp Metering – Signal on a ramp to regulate the flow of traffic onto the freeway.

Recurrent Congestion - A condition lasting for 15 minutes or longer where travel demand exceeds freeway design capacity, as evident by vehicular speeds of 35 mph or less occurring during peak commute periods on a typical, incident-free weekday.

Surveillance Stations – All detector locations including ramp-metering stations are termed surveillance stations.

Arnold Schwarzenegger
Governor

Sunne Wright McPeak
Secretary, Business, Transportation and Housing Agency

Jeff Morales
Director, California Department of Transportation

Karla Sutliff
Division Chief, Traffic Operations

For more information or additional copies of this report, please contact Rex Cluff at (916) 651-9059 or by email: Rex_Cluff@dot.ca.gov